



# Movement & Physical Activity In Parkinson's Disease

CAROL SAMES PHD, UPSTATE MEDICAL UNIVERSITY  
DEPARTMENT OF PHYSICAL THERAPY EDUCATION & *VITALITY* FITNESS PROGRAM

# Outline

- **1. Benefits of Regular Physical Activity**
- **2. Sedentary Behavior & Impact on Health**
- **3. Current Research on Parkinson's Disease & Physical Activity**
- **4. Nuts & Bolts of Physical Activity**
- **5. FITT Principle of Physical Activity**
- **6. Physical Activity Demonstration**
- **7. Community Resources**

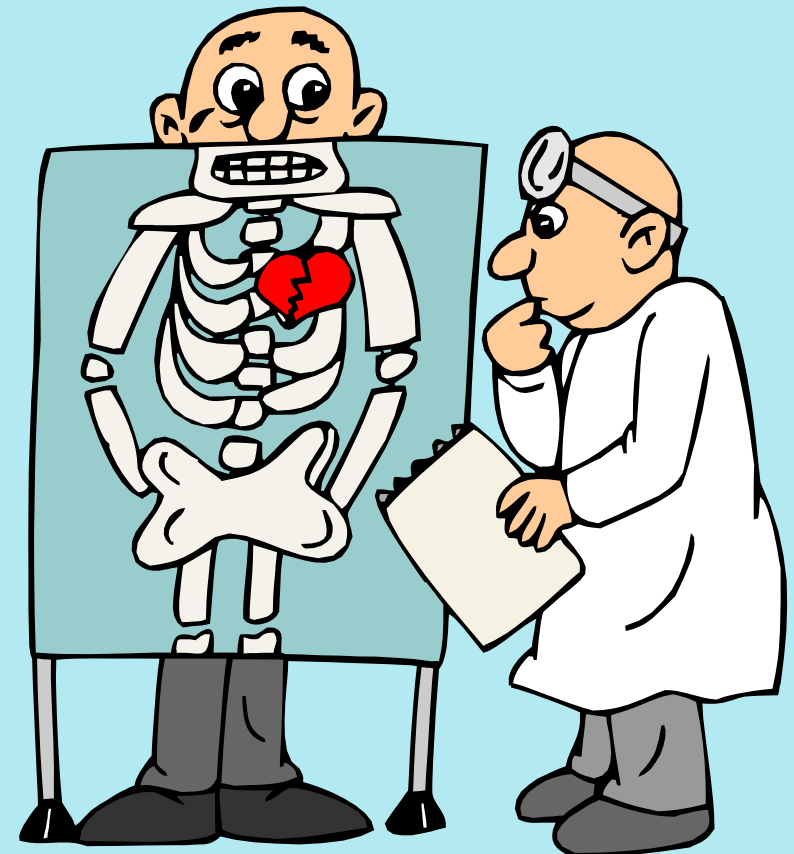
# Benefits of Regular Physical Activity

- Higher activity levels are associated with lower death rates from:
  - 1. heart disease
  - 2. all cardiovascular disease
  - 3. colon & breast cancer
  - 4. type II diabetes.



# Benefits of Regular Physical Activity

- More activity with less fatigue
- Less shortness of breath
- Heart & Lungs work better
- Improved circulation to hands & feet
- Decreased risk of osteoporosis
- Decreased anxiety & depression
- Improved feelings of self-worth
- Improved performance of work, recreational and life activities
- Improved Quality of LIFE !!!



# Benefits of Regular Physical Activity

- Increase Weight Loss
- Long-Term Maintenance of Weight Loss
- Increase muscle strength-you need muscle to MOVE!
- Increase flexibility
- Reduces risk of falls and fractures
- Lower risk for developing vascular dementia.
- **WOW! That's a lot of benefits!**



# Sedentary Behavior & Impact on Health



# **Risks Associated With A Sedentary Lifestyle**

- **A sedentary lifestyle is an INDEPENDENT RISK factor for cardiovascular disease.**
- **Abnormal glucose metabolism**
- **Weight gain leading to obesity**
- **Increased risk of cardiovascular death**
- **Premature death**
- **Women >30 years old, sedentary lifestyle has been demonstrated to be a stronger Risk Factor for Cardiovascular Disease than smoking.**

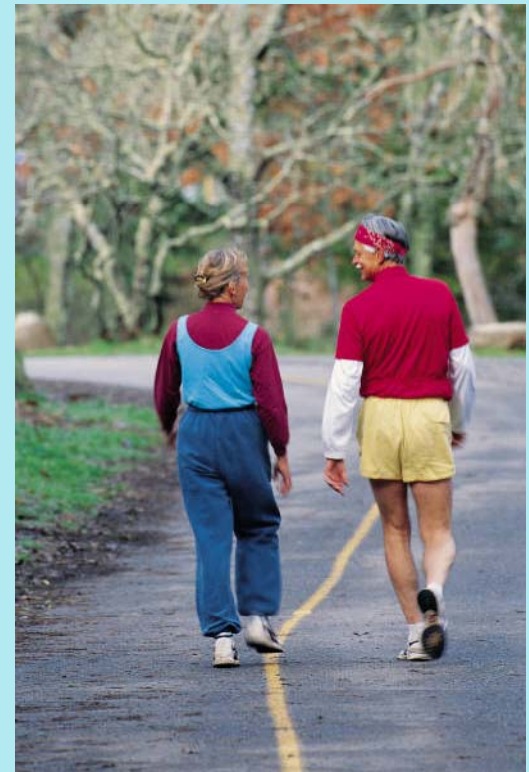
# The Bottom Line.....

- **The bad news----Individuals are engaged in TOO MUCH SEDENTARY ACTIVITY and it is contributing to poor health.**
- **The good news---even small breaks in activity behavior can reverse negative metabolic outcomes.**
- **The bad news---Physical activity does not guarantee protection if individuals are engaged in long periods of sedentary activity.**



# The Bottom Line.....

- Our bodies were designed for movement--inactivity causes physiological problems that become worse with time.
- A sedentary lifestyle is associated with decreased physical function & adverse health outcomes.
- An activity program can be started at any age, with any body type or presence of disease.



# Research on Physical Activity & Parkinson's Disease

- Reynolds et al. (2016). Review—aerobic & strength training demonstrated improvement in motor function, mood, cognition and sleep especially in early stages of disease with minimal side effects & adverse effects.
- Murray et al (2014). Systematic review—aerobic, strength training & dance demonstrated improvement in cognitive function—optimal type, amount, duration unclear.

# Research on Physical Activity & Parkinson's Disease

- Allen et al. (2011). Meta-analysis found exercise (walking, treadmill, tai chi, dance) improved & motor training improved performance on balance related activities.
- Goodwin et al. (2008). Meta-analysis found exercise improved physical functioning, quality of life, leg strength, balance and walking distance & speed.

# Can Physical Activity Be Beneficial In Parkinson's Disease?

- **YES IT CAN!** Limited long term research but short term studies have demonstrated improvements in balance, gait, strength, physical function, cognitive function, and quality of life.
- The main goal of activity is to delay disability, prevent secondary complications, and improve quality of life.
- Four key health outcomes of an activity program include: gait (walking), transfers, balance, and joint mobility and muscle power (strength) to improve function.

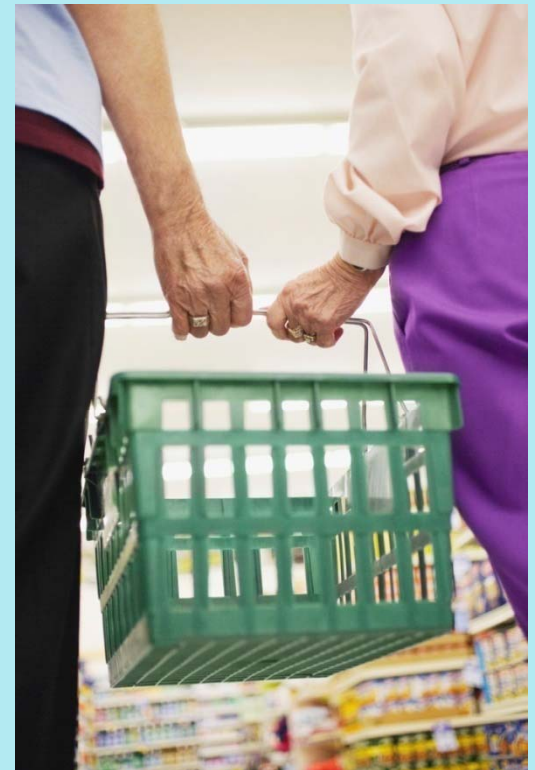
# Nuts & Bolts of Physical Activity

- **Must be individualized based on movement symptoms, functional abilities, physical fitness, secondary diagnoses, and medications.**
- **One size does not fit all!**



# Nuts & Bolts of Physical Activity

- Individualized movement considerations:
- Is movement speed slowed?
- Difficulty starting movement?
- Episodes of “freezing” movement?
- Difficulty with balance or posture/falls?
- Wriggling/writhing movements?
- Tremor?
- Muscle stiffness/rigidity?
- Is Physical Therapy Needed Before Independent Physical Activity?



# Nuts & Bolts of Physical Activity

- Individualized non movement considerations:
- Sleep difficulty
- Fatigue
- Depression, lack of motivation, anxiety
- Difficulty with memory/concentration
- GI difficulty
- Urinary difficulty
- Additional diagnoses



# Nuts & Bolts of Physical Activity

- **Develop an activity plan.**
- **PLAN FOR SUCCESS.**
- **Keep an activity journal-include type of activity, duration, time of day, perceived effort, adaptations, problems, pain that persists 2 hours after activity.**
- **Set Short & Long-term goals.**
- **Reward yourself for goal achievement.**





# Nuts & Bolts of Physical Activity

- **START SLOWLY**-especially if you have been inactive.
- **Be creative**—activity is all around you.
- **Be flexible**—after all, this is CNY and weather changes quickly. *Some activity is always better than no activity.*
- **Be patient.**
- **Consistency is the key to success.**



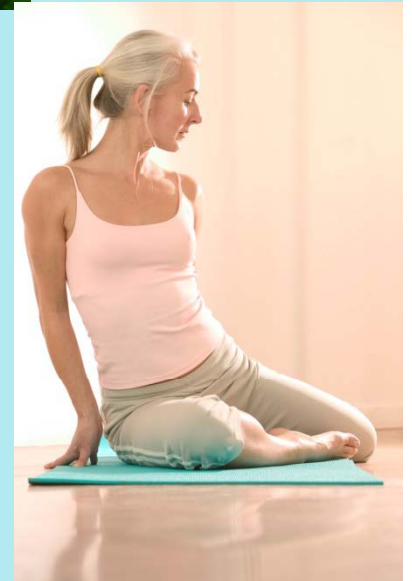
# FITT Principle of Physical Activity

- **Frequency**
- **Intensity**
- **Time**
- **Type of Activity**
- **Guidelines developed by the American College of Sports Medicine.**



# FITT Principle—Aerobic Activity

- **Frequency—3 to 5 days/week**
- **Intensity—fairly light to somewhat hard.**
- **Time—150 minutes/week; aim for 30 minutes per session BUT can break into smaller segments.**
- **Type—continuous, large muscle group activities such as walking, dancing, activities of daily living, swimming, water activities, yoga.**



# FITT Principle—Type of Aerobic Activity

- **Aerobic (continuous) Activity:** selection is dependent on PD clinical symptoms, functional ability/limitations, and any additional diagnoses.
- **Traditional & Non Traditional Activities.**
- **BE CREATIVE!**



# FITT Principle—Resistance (Strength) Activity

- Frequency-- 2-3 days/week.
- Intensity—fairly light to somewhat hard.
- Time-- 1-2 sets repeating each exercise 8-12 times.
- Type—machines, hand weights, body weight, stability ball, therabands, weighted balls, functional activity.



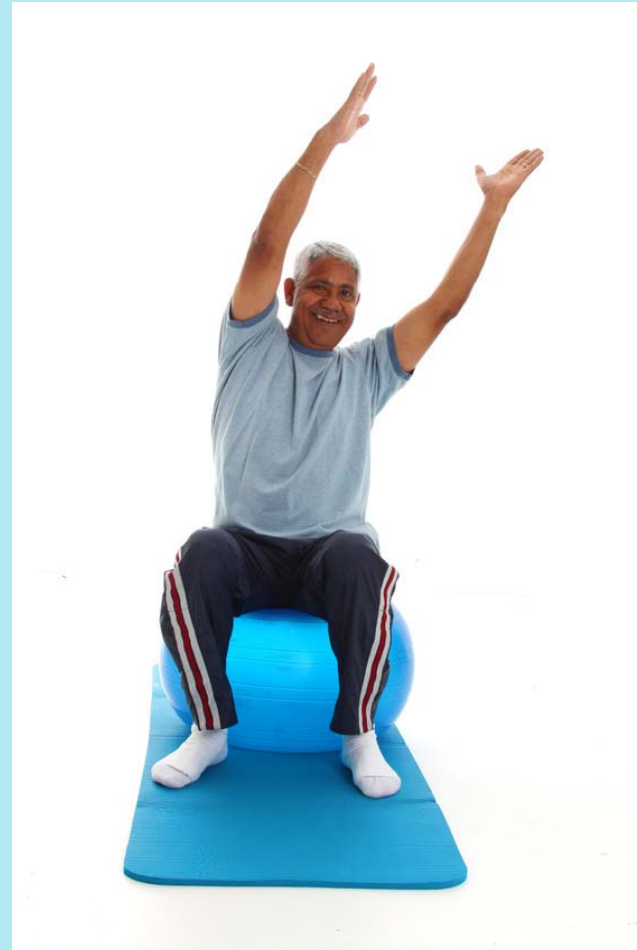
# FITT Principle—Type of Resistance (Strength) Activity

- **Resistance (strength)**  
Muscles of trunk & hip to prevent faulty posture; all major muscles of leg to maintain mobility; upper extremity to prevent frozen shoulder.
- **Can be done in a chair or standing using body weight.**
- **Emphasize proper form, no breath holding, pain free range of motion and safety.**



# FITT Principle—Flexibility (Range of Motion) Activity

- **Frequency-- 1-7 days/week.**
- **Intensity-- full extension, flexion, rotation, or stretch to the point of slight discomfort.**
- **Time-- major muscle groups holding stretch for 10-30 seconds.**
- **Type—Slow static stretch for all major muscle groups.**



# FITT Principle—Type of Flexibility (Range of Motion) Activity

- **Flexibility Activity: Slow static stretch (no bouncing) for all major muscle groups for all severity stages of PD.**
- **Spinal mobility & neck flexibility should be emphasized as correlated with posture, gait, balance & activities of daily living.**





# FITT Principle—Balance Activity

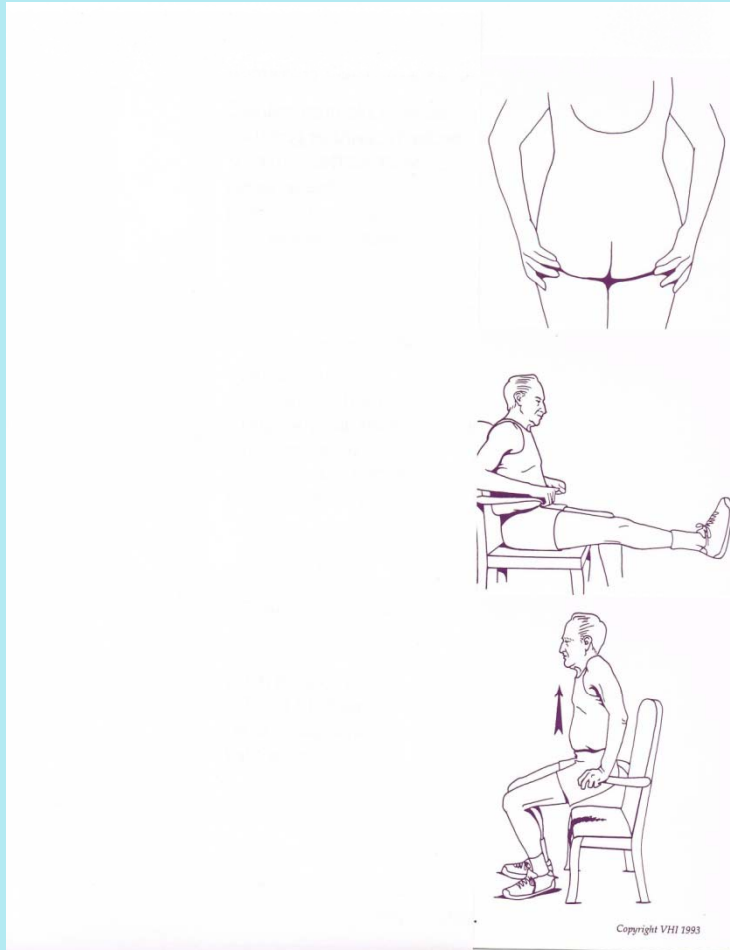
- **Frequency—3 days/week.**
- **Intensity—challenging but safe.**
- **Time-- 4-5 exercises (standing & moving).**
- **Type—stepping & reaching in all directions, stepping up & down, obstacles, standing & sitting, tai chi, dancing.**



# General Exercises to Improve Flexibility & Strength

- Knee Extension/Flexion
- Toe/Heel Raises/Circle
- Lower Leg Stretch--Stand
- Hamstring Stretch--Sitting
- March in Place—Sit/Stand
- Hip Out/Together—Sitting
- Hip Pendulum--Stand
- Draw In (10x10sec) & Butt Squeeze (10x10sec)
- Sit to Stand--Sitting
- Wall Squats--Standing
- Wall Push Up—Standing
- Chair Push Up--Sitting
- Seated Sit-ups—Sitting
- Curl Ups—floor/bed
- Front/Side Lunges—Standing

# Exercise Pictures



- **Butt Squeeze--strength**
- **Knee Extension/Flexion-  
strength**
- **Chair Push Up--strength**

# Exercise Pictures



**Lower Leg Stretch--  
flexibility**



**Hamstring  
Stretches--  
flexibility**

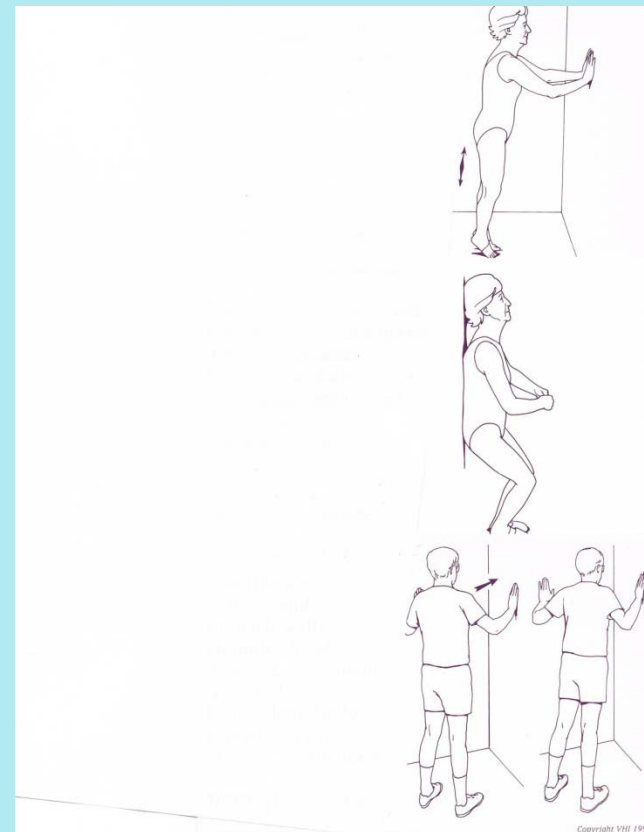


# Exercise Pictures

**Sit To Stand—strength & balance**      **Toe Raises, Wall Squats & Wall Push Ups—strength & balance**



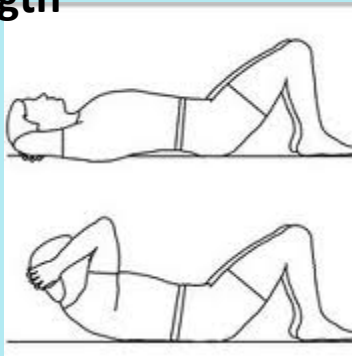
Copyright © 2013 F. A. Davis Company www.fadavis.com



Copyright VIII 1996

# Exercise Pictures

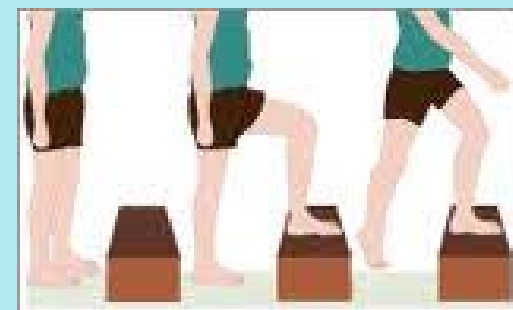
**Crunches (cross arms over chest)—core strength**



**Lunges—strength & balance**



**Leg Raises--strength**



**Step Ups—strength & balance**

# How Do I Become More Active?

- 1. What are you currently doing? Identify your starting point and your limitations.
- 2. Identify your barriers to activity.
- 3. Make activity a **PRIORITY**.
- 4. Make activity **FUN**—yes **FUN** 😊
- 5. Make activity interesting—what do you enjoy, what would you like to do?
- 6. Set goals that are specific, realistic & important to you.
- 7. Make activity part of your regular routine—yard work, household activity, taking the stairs, walking the dog, strength training or stretching during commercials. **Be Creative!**

# Special Considerations

- **Outcome of activity training varies significantly by individual due to symptoms and complexity of disease.**
- **Safety during activity is imperative. Select activities with safety in mind—look at the environment & equipment.**
- **Medications can further alter HR, BP and also can cause headaches, blurred vision, dry mouth.**





# Special Considerations

- **If cognitive changes are present, help and support may be needed.**
- **Avoid multi-tasking when starting an activity program.**
- **Complete 1 activity before starting another activity.**



# Special Considerations

- If long-term use of Levodopa, is there evidence of “end of dose wearing off” or predictable/unpredictable “off time”.
- If so, be active around these times.



# Community Resources

- If you find it difficult to be active on your own or you are looking for a specialized, individualized exercise program, the *Vitality Fitness Program* may be for you.



# ***Vitality* Fitness Program—Upstate Medical University**

- **Located at the Institute for Human Performance**
- **Land & Aquatic Programs**
- **Initial Assessment Completed**
- **Staffed by Exercise Physiologists**
- **Individualized program depending on limitations, medical history, functional ability, occupational and personal goals.**
- **Various class times from 8:15A-4:30P on Monday, Wednesday, and Friday.**
- **Call 464-9992 for additional information.**

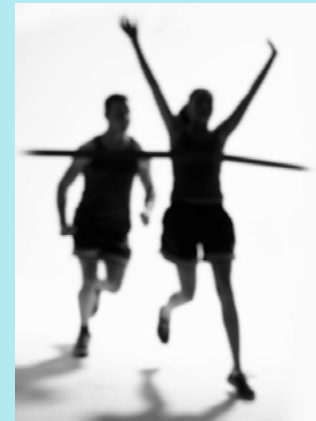


# Community & Online Resources

- YMCA—multiple sites in Onondaga County—indoor track, pool, aerobic equipment, Active Older Adult Programming.
- <http://www.syracuse.ymca.org/programs/healthy-living/fitness/active-older-adults.html>
- Davis Phinney Foundation—Parkinson’s Exercise Essentials Download Video
- <http://www.davisphinneyfoundation.org/living-pd/dvd/>
- Michael J Fox Foundation—Exercise Podcasts
- <https://www.michaeljfox.org/understanding-parkinsons/living-with-pd/topic.php?exercise&navid=exercise>
- Syracuse Parks & Recreation—Senior Fitness Programming  
<http://www.syracuse.ny.us/parks/FitnessAndWellness.html>

# The Bottom Line

- **KEEP MOVING**-you will feel the physical, emotional and quality of life benefits of being active.
- **Parkinson's Disease isn't a reason to sit on the sidelines**-whatever your level of ability, you can be active.
- **YES YOU CAN!**



# References

- ACSM's Guidelines for Exercise Testing & Prescription (9<sup>th</sup> Edition). 2013. Wolters Kluwer/Lippincott, Williams & Wilkins. ISBN-13: 978-1-60913-605-5
- ACSM's Resource Manual for Guidelines for Exercise Testing & Prescription (7<sup>th</sup> Edition). 2014. Wolters Kluwer/Lippincott, Williams & Wilkins. ISBN-13: 978-1-60913-956-8
- McArdle, Katch & Katch. Exercise Physiology: Nutrition, Energy, and Human Performance (8<sup>th</sup> Edition). 2015. Wolters Kluwer/Lippincott, Williams & Wilkins. ISBN-13: 978-1-4511-9155-4

# References

- Allen et al. Balance & Falls in Parkinson's Disease: A Meta-analysis of the Effect of Exercise and Motor Training. *Movement Disorders*, 26(9), 2011, pp. 1605-1615.
- Goodwin et al. The Effectiveness of Exercise Interventions for People with Parkinson's Disease: A Systematic Review and Meta-Analysis. *Movement Disorders*, 23(5), 2008, pp.631-640.



# References

- Murray et al. The Effects of Exercise on Cognition in Parkinson's Disease: A Systematic Review. *Translational Neurodegeneration*, 2014, 3(5).
- Reynolds et al. The Therapeutic Potential of Exercise to Improve Mood, Cognition, and Sleep in Parkinson's Disease. *Movement Disorders*, 2016, 31(1), pp. 23-38.